

Exhibit 1

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

VIDEOTAPED DEPOSITION OF CHRIS KEMERER, Ph.D.
San Francisco, California
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Volume 1

Reported by:
RACHEL FERRIER, CSR No. 6948

Job No. CS2265292

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1 BY MS. ANDERSON:

2 Q We will discuss that in more detail in a moment,
 3 the reliance you have on other experts in this case.

4 A Mm-hmm.

5 Q But now I would like to ask you: Besides
 6 reliance on other experts' opinions in this case --

7 A Mm-hmm.

8 Q -- and besides reliance on the work of the
 9 technical support team you described, did you rely on
 10 the assistance of anyone else in preparing your opinions
 11 in this matter?

12 A Well, certainly I've had many conversations with
 13 the lawyers at Orrick, and I would put them on that list
 14 as well.

15 Q All right. Of the analyses that you discuss in
 16 your reports, is there any analyses that you performed
 17 personally as opposed to having delegated it to the
 18 technical support team you described?

19 A Well, I think, perhaps, that mischaracterizes my
 20 previous testimony. I have done all of the analysis
 21 personally. I have delegated certain tasks that support
 22 that analysis to the technical support team -- again,
 23 programming, that kind of thing -- but all of the
 24 analysis is my analysis and was directed by me.

25 Q And as we go through your opinions today, I will

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1 be asking you to tell me what portions of the reports we
 2 are discussing reflect analyses you actually,
 3 personally, did in terms of running computer programs or
 4 the like. Okay?

5 MR. RAMSEY: Objection; form.

6 BY MS. ANDERSON:

7 Q If you are having difficulty remembering all
 8 those events.

9 MR. RAMSEY: Objection; form.

10 THE WITNESS: Okay. I really don't understand
 11 that, because, again, I thought I answered that question
 12 previously saying they are all my analyses.

13 BY MS. ANDERSON:

14 Q Okay. Did you, personally, run the computer
 15 programming required to do your PageRank analyses?

16 A No, I did not.

17 Q Okay. So that's an example of something that you
 18 didn't personally do. You delegated to someone else;
 19 correct?

20 A I directed someone else to do.

21 Q Right.

22 And you understand that you having directed
 23 someone to do it, but you didn't personally run the
 24 analyses on the computer yourself; correct?

25 A My hands were not on the keyboard; that's

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1 correct.

2 Q Okay. All right. So what I'm trying to
 3 understand --

4 A Mm-hmm.

5 Q -- if you can tell me, as you sit here today --

6 A Mm-hmm.

7 Q -- can you give me a complete list of the work
 8 that you instructed the technical support team to do to
 9 assist you?

10 A That would be hard to do. This is sort of the
 11 question -- sounds like the question you asked me
 12 earlier, and it's hard to do, but perhaps when we
 13 actually start talking about individual analyses, I will
 14 be able to give you a better answer.

15 Q All right. But as you sit here today, is it fair
 16 to say that you can't give me a complete list, as you
 17 sit here today, without looking through your reports?

18 MR. RAMSEY: Objection; form.

19 THE WITNESS: Well, I can't give a complete list,
 20 in part, because this represents months of -- of effort
 21 and three separate reports and a lot of analyses and
 22 different reports, and I just -- it would be a long
 23 list, and it probably is better -- and I feel like my --
 24 my -- I will be less -- less likely to forget something
 25 if we do this sort of analysis by analysis.

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1 BY MS. ANDERSON:

2 Q All right. Let's take a look at Exhibit 1440,
 3 which is your opening report, and what I would like you
 4 to do, please, is walk me through the appendices to
 5 Exhibit 1440 --

6 A Mm-hmm.

7 Q -- so that I have an understanding of the overall
 8 organization of your opinion, because we are going to be
 9 referring to it a bit through the course of the day.

10 A Mm-hmm.

11 Q And if it makes it a little bit easier for you,
 12 Appendix A starts on page 65.

13 A Okay.

14 Okay. I'm ready.

15 Q Okay. Tell me, what is Appendix A?

16 A It is a glossary of terms.

17 Q Who prepared Appendix A?

18 A This was prepared by the technical support staff
 19 under my direction.

20 Q They provided you a draft of this?

21 A Yes. They provided me a draft of this.

22 Q Let's turn to Appendix B.

23 What is this?

24 A This is my CV.

25 Q All right. Does your CV, your curriculum vitae,

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1 A Again, I believe this was available on the web,
 2 but I don't think they drew this diagram, no.
 3 Q You think you downloaded this from the web?
 4 A I believe so, yes.
 5 Q And you think they downloaded it for you; is that
 6 true?
 7 A At my request, yes.
 8 Q All right. And where it says "API level" on the
 9 left-hand side of Appendix L, what does that mean to
 10 you?
 11 A Okay. So Appendix L, labeled "Android Version
 12 Names," API level ranging from 23, most recent, to
 13 No. 1. These are, essentially, you know, versions of --
 14 of Android that have been released, 23 being the most
 15 recent with the code name "marshmallow."
 16 Q Thank you.
 17 A And Appendix M, what is Appendix M?
 18 A Appendix M, labeled "PageRank Data," are the raw
 19 data that are -- form the basis for the PageRank
 20 analysis in my report.
 21 Q Who prepared Appendix M?
 22 A Appendix M is the output from running the
 23 PageRank software.
 24 Q And that software was run by your technical
 25 support team; correct?

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1 A Under my direction, yes.
 2 Q But you, personally, didn't run it; correct?
 3 A I did not have my hands on the keyboard; that is
 4 correct.
 5 Q Let's take a look at Appendix N, "N" as in Nancy.
 6 Who prepared Appendix N?
 7 A Appendix N, the timeline of facts, was prepared
 8 by my technical support team, also known as my research
 9 support team.
 10 Q Thank you.
 11 Did you do anything to confirm the accuracy of
 12 Appendix N?
 13 A I did not go through it line by line, but I did
 14 reference it at various points, and when I was reading
 15 documents, I would refer to it to see where we were on
 16 the overall timeline, so I made use of it, but I did not
 17 go and confirm or verify each and every row.
 18 Q Let's turn to Appendix P, which starts on
 19 page 222.
 20 Who prepared Appendix P?
 21 A Okay. Appendix P, the list of copied API
 22 packages, was prepared by my technical support team.
 23 Q And then let's turn to Appendix Q.
 24 What is Appendix Q?
 25 A Appendix Q, labeled "R Scripts for Counting of

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1 Number of Method Changes," is a computer programming --
 2 excuse me, computer program written in the R language,
 3 and similar to the PHP scripts earlier, it's a script,
 4 essentially, collect and prepare data for use in my
 5 analysis of the stability methods changes.
 6 Q And did your technical support team prepare
 7 Appendix Q?
 8 A My technical support team wrote Appendix Q under
 9 my direction, yes.
 10 Q Okay. Is it fair to say you have never written a
 11 script in the R language?
 12 A That would be fair, yes.
 13 Q Let's turn to Appendix R, which starts on
 14 page 260.
 15 What is Appendix R?
 16 A Appendix R, labeled "Fragmentation Chart," is a
 17 table with the list of APIs where the APIs that were
 18 copied -- in this case, it says they are listed in
 19 green, and in the color version of this, the dark cells
 20 in the matrix are the copied packages.
 21 Q Okay. Did your technical support team prepare
 22 this appendix?
 23 A At my direction, yes, they did.
 24 Q Okay. And then, if you could, let's just quickly
 25 do this as well for Exhibit 1441, just so we know what

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1 we are referring to.
 2 Exhibit 1441 is your rebuttal report from
 3 February 8, 2016; correct?
 4 A I have that in front of me, yes.
 5 Q All right. And Appendix A is a glossary of
 6 terms.
 7 Again, is this a glossary that your technical
 8 support team prepared for you?
 9 A Yes. It's very similar to the appendix in the
 10 opening report.
 11 Q All right. And Appendix B, the list of materials
 12 considered, is this the list of materials that were
 13 provided to you but not necessarily reviewed by you for
 14 purposes of your rebuttal?
 15 MR. RAMSEY: Objection; form.
 16 THE WITNESS: Again, Appendix B, labeled
 17 "Materials Considered," again, are materials that I had
 18 available to me to prepare my opinion.
 19 BY MS. ANDERSON:
 20 Q Is it correct that the only materials you
 21 actually relied upon are those that are identified in
 22 footnotes in your report, your rebuttal report?
 23 A That's my standard practice, yes, to try to pull
 24 out -- highlight for the reader those things that are
 25 important that I'm relying on and putting them in

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1 footnotes in the text.

2 Q Okay. And Appendix C, is this something that was
3 prepared by your technical support team for you?

4 A Appendix C, labeled "JDK PageRank Full Data Set,"
5 again, is output from the PageRank algorithm, and this
6 is the raw data that supports my analysis -- the
7 PageRank analysis that appears in my report.

8 Q Okay. And this was the output from a computer
9 program that was run by your technical support team;
10 correct?

11 A Under my direction, yes, that's correct.

12 Q And Appendix D, entitled "Android PageRank Full
13 Data Set," is this a listing of PageRank scores that was
14 prepared and provided to you by the technical support
15 team?

16 A Actually, my answer for Appendix D is the same as
17 my answer for Appendix C, but it's just -- it's a
18 different underlying data set.

19 Q Thank you.

20 And Appendix E, is this an appendix that was
21 prepared for you by your technical support team as well?

22 A Appendix E, the PHP script for parsing HTML
23 documentation of Java SE 5 API packages, again, is a
24 script to collect data that's necessary to be used in my
25 analysis, yes.

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1 Q And this is a script that you did not participate
2 in preparing; correct?

3 MR. RAMSEY: Objection; form.

4 THE WITNESS: I did not personally write this
5 script, but it was done under my direction.

6 BY MS. ANDERSON:

7 Q But you don't know how to write a PHP script for
8 parsing HTML documentation of a Java SE 5 API package;
9 correct?

10 MR. RAMSEY: Objection; form.

11 THE WITNESS: Again, I believe I'm capable of
12 writing such a script, but it's not how I spend my time.

13 BY MS. ANDERSON:

14 Q Have you ever programmed in PHP?

15 A I have not, but, again, I believe I'm capable of
16 doing it.

17 Q Because you could have someone teach you the PHP
18 language to write a script? Is that what you are
19 saying?

20 A Or I would read a PHP book.

21 Q So you would have to become educated in PHP
22 before you could do that; correct?

23 MR. RAMSEY: Objection; form.

24 THE WITNESS: Yes. Before I could do this task,
25 I would have to train myself in PHP.

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1 BY MS. ANDERSON:

2 Q All right. When you are not currently trained in
3 PHP; correct?

4 A That's correct.

5 Q And that's also true for the R language as well;
6 correct?

7 MR. RAMSEY: Objection; form.

8 THE WITNESS: Yes. I do not consider myself an R
9 programmer.

10 BY MS. ANDERSON:

11 Q And that's also true for the Java language;
12 correct?

13 A When you say "also," could you maybe give me a
14 more fulsome question.

15 Q Sure.

16 As you sit here today, you could not write a
17 script in the Java language?

18 A I'm not a Java programmer, no.

19 Q So as you sit here today, you could not write a
20 script for the Java language; correct?

21 A The only reason I hesitate -- I'm not sure why
22 you refer to it as a "Java script." I usually think of
23 it as a "Java program," but I'm not a Java programmer.

24 Q Okay. So as you sit here today, you could not
25 prepare a Java program?

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1 MR. RAMSEY: Objection; form.

2 THE WITNESS: Not without additional effort, no.
3 BY MS. ANDERSON:

4 Q And education as well; you would need additional
5 education in the language to be able to do that;
6 correct?

7 A I would expect I would have to get up to speed by
8 either taking training or training myself.

9 Q Let's take a look at Appendix G.

10 W What is Appendix G?

11 A Can you give me a page number, please.

12 Q Sure. Page 211.

13 A Appendix G, "R Script for Calculating Package
14 Changes Within Java SE Versions," again, is data
15 collection in support of analysis I did in the paper.

16 Q And this is a script that was prepared and run by
17 your technical support team; correct?

18 A It was written by my technical support team under
19 my direction, yes.

20 Q And turning to Appendix H, which is on page 218,
21 Appendix H is entitled "R Script for Calculating Package
22 Changes Across Android Versions."

23 This is an appendix that was prepared for you by
24 your technical support team; correct?

25 A My answer for Appendix H is the same as my answer

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1 A As I've described in the report, analysis was
 2 done of which of these APIs are necessary for the app
 3 which are used by the app in question.

4 Q So when you say that this appendix reflect which
 5 APIs are depended upon by the listed apps, you mean
 6 which ones are used by the app in question; correct?

7 A I'm not sure what the distinction is, but, yes.

8 Q And an indication of a "1" or a "0" in each box
 9 in the chart reflected in Appendix B, what does that
 10 mean?

11 A It's binary. 1 is it's used and 0 is it's not.

12 Q Let's turn to Appendix C, which appears on
 13 page 28 of Exhibit 1442, entitled "R Script for
 14 Calculating Package Change Across Java SE Versions."

15 Is this a script provided to you by your
 16 technical support team?

17 A Again, this was a script written by the technical
 18 support team under my direction.

19 Q Appendix D, which is on page 35, entitled "R
 20 Script for Calculating Package Change Across Android
 21 Versions," is this a script that was provided to you by
 22 the technical support team?

23 A My answer is the same as for Appendix C.

24 Q All right. I think we have exhausted your
 25 appendices to your reports.

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1 Let's turn now to the substance of some of your
 2 opinions outside of that.

3 First, I would like you to address certain of the
 4 technical terms that you used in your report so we can
 5 make sure we have an understanding of how you are using
 6 them in your opinions. All right?

7 A Okay.

8 Q Obviously throughout each of the reports that you
 9 have submitted in this case, you have referred to the
 10 acronym API -- or the term "API."

11 What do you mean by "API," as used in your
 12 opinions?

13 A Okay. API, although has a broad set of
 14 definitions in different context, here we are talking
 15 about the application programming interfaces that were
 16 written by Oracle and copied by Google in 37 instances,
 17 and that's the subject of the lawsuit.

18 Q So are you saying that your understanding of API
 19 is something that's limited to just the items that
 20 Oracle accuses Google of copying in this case?

21 A No, but that has been the focus of my attention
 22 here.

23 Q So just to be clear, what I'm asking you is to
 24 tell me, what do you mean by "API" as used in your
 25 reports?

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1 MR. RAMSEY: Objection; form.

2 THE WITNESS: Okay. Again, in different context,
 3 I think it ends up having different meanings. In
 4 particular -- you know, you have to give me the context
 5 and then I can give you a better answer.

6 BY MS. ANDERSON:

7 Q Do you have an understanding as to whether API is
 8 used in any other context besides the allegation by
 9 Oracle that Google has copied some aspect of certain
 10 APIs?

11 A Yes. As I discuss in a later report, there is a
 12 whole API economy business model that has other things
 13 having -- that are different than how we have been
 14 describing APIs in the context of this lawsuit.

15 Q Tell me, what is your understanding of the
 16 meaning or meanings of the term "API," as you sit here
 17 today?

18 A The most relevant meaning here, I use the term
 19 "API" to refer to the declaring code and the structure,
 20 sequence, and organization of the application
 21 programming interfaces in Java.

22 Q What other meanings are you familiar with for the
 23 term "API"?

24 MR. RAMSEY: Objection; form.

25 THE WITNESS: In my second report, there is a

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1 whole notion of APIs as tools to access resources that
 2 are -- and it's used in a much broader context.

3 BY MS. ANDERSON:

4 Q What do you mean by that, "used in a much broader
 5 context"?

6 A That it means that the broader definition, the
 7 idea that it's -- it's the mechanism by which you access
 8 some other resource.

9 Q What do you mean by "other resource"?

10 A It could be a variety of things.

11 Q Like what?

12 A Could be data.

13 Q What else?

14 A Could be an operating system.

15 Q What else?

16 A Those are two examples that come to mind.

17 Q Could it include a service?

18 MR. RAMSEY: Objection; form.

19 THE WITNESS: I don't know. I would have to
 20 think about that.

21 BY MS. ANDERSON:

22 Q Have you heard the phrase "software as a
 23 service"?

24 A I have.

25 Q What does that mean?

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1 analysis, using standard tools that are available
2 commercially.

3 Q Describe to me an overview of the methodology
4 that was performed in connection with running PageRank
5 analysis in these different aspects that you studied.

6 MR. RAMSEY: Objection; form.

7 THE WITNESS: So at a high-level, PageRank is a
8 tool to analyze network, so first you have to be able to
9 represent the thing you are interested in as a network,
10 and so, in this case, we are looking at software, and we
11 want to think about the components as being, you know,
12 interconnected nodes and network, and so we have to
13 collect data on the software in terms of what their
14 connections are. And then there's, again, commercially
15 available tool to compute the PageRank values, and
16 earlier today you had me point out the raw data values
17 that I provided in the appendix, and those reflect the
18 centrality of the nodes in the network, in this case
19 these classes.

20 BY MS. ANDERSON:

21 Q With respect to the PageRank analyses performed
22 in connection with your opinions in this case, did you,
23 personally, conduct those analyses?

24 MR. RAMSEY: Objection; form.

25 THE WITNESS: They are my analyses, yes.

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1 BY MS. ANDERSON:

2 Q Did you, personally, conduct them?

3 MR. RAMSEY: Objection; form.

4 THE WITNESS: I conducted them with the
5 assistance of my research team.

6 BY MS. ANDERSON:

7 Q Did the technical support team perform these
8 analyses themselves?

9 MR. RAMSEY: Objection; form.

10 THE WITNESS: The analyses are mine. My
11 technical support team ran the tools.

12 BY MS. ANDERSON:

13 Q Okay. What tools are you referring to?

14 A These are the tools listed here in the report,
15 for example, NetworkX.

16 Q Any other tools used by the technical support
17 team in conducting the PageRank analyses?

18 A In other places, we describe the tool Understand,
19 which is also a commercially available tool for code
20 analysis.

21 Q Any other tools used in connection with this
22 analysis?

23 A The custom-written scripts, the PHP and R
24 scripts, are also tools used to support the analysis.

25 Q Any other tools used to conduct the analysis?

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1 A We use Excel to show the results.

2 Q Have you given me a full list of tools used in
3 conducting the analyses concerning PageRank in your
4 opinions?

5 A Off the top of my head, yes, I believe that's
6 correct.

7 Q All right. Who selected the use of NetworkX?

8 A I did in consultation with my technical support
team.

9 Q Prior to this case, had you ever used NetworkX?

10 A I had not.

11 Q Prior to this case, had you ever used Understand?

12 A Prior to this case, I had not.

13 Q Prior to this case, had you ever used, PageRank?

14 A Prior to this case, no.

15 Q Did the technical support team suggest to you the
use of NetworkX, Understand, or PageRank in connection
with this case?

16 A We discussed a variety of options, but, yes,
those were the options that seemed to be the best suited
for this task.

17 Q And those were suggested to you by your technical
support team; correct?

18 MR. RAMSEY: Objection; form.

19 THE WITNESS: After they completed a review of

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1 available tools that I asked them to do.

2 BY MS. ANDERSON:

3 Q Prior to this case, had you ever heard of
4 NetworkX?

5 A I'm not certain.

6 Q Prior to this case, had you ever heard of
7 understand?

8 A Not certain about that either.

9 Q Prior to this case, had you ever heard of
10 PageRank?

11 A Oh, yes. Everybody knows PageRank.

12 Q Okay. And in what context had you heard about
13 PageRank before?

14 A I think everyone understands that PageRank,
15 developed by Google, is the underpinnings of the Google
16 search engine.

17 Q What was the role of Understand in connection
18 with your opinions in this case?

19 MR. RAMSEY: Objection; form.

20 THE WITNESS: I view it as a data collection
tool.

21 BY MS. ANDERSON:

22 Q What kind of data did Understand collect?

23 A Collects data about -- it actually shows up in
various places. We are talking about it in the context

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1 of PageRank, but I think it also is part of the other
2 software analyses.

3 Basically it's a -- something that allows you to
4 pull raw data and then put it in some other
5 representation so that you can do analysis on it.

6 Q What was the role of Understand in connection
7 with this case?

8 A Again, as a tool for pulling raw data and putting
9 it in raw data for analysis.

10 Q Can you be more specific about what Understand
11 did in connection with this case.

12 A Yes. You -- you -- you have software that it
13 reads, and then it generates output, which is a
14 different representation of that software, and a
15 representation that is more amenable to analysis than
16 the raw source code.

17 Q Can you be more specific in defining what
18 Understand did in connection with this case?

19 MR. RAMSEY: Objection; form.

20 THE WITNESS: No.

21 BY MS. ANDERSON:

22 Q What role did NetworkX have in connection with
23 the analysis in this case?

24 A NetworkX is the tool used to do the PageRank
25 calculation.

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1 Q When you say that NetworkX was the tool used to
2 do the PageRank calculation, can you be more specific in
3 defining what NetworkX actually did in connection with
4 your analyses?

5 MR. RAMSEY: Objection; form.

6 THE WITNESS: Yes. It generates the PageRank
7 values that, again, I provided in the appendices.

8 BY MS. ANDERSON:

9 Q Can you be more specific about how it goes about
10 doing that?

11 A It implements the PageRank algorithm.

12 Q And from where did you get the PageRank algorithm
13 for purposes of use by NetworkX?

14 A I believe it is part of the NetworkX capability.

15 Q Why did you conclude it was appropriate to use
16 PageRank for purposes of the analysis in this case?

17 A Well, stepping back, the -- the overarching issue
18 is the substantiality, and centrality is, I believe, a
19 measure of that in which -- is an answer I gave earlier.

20 PageRank is a metric for measuring centrality,
21 and I also know that PageRank has been used by other
22 researchers in looking at centrality in look -- thinking
23 about software as a set of interconnected nodes.

24 So based on that literature, it seemed an
25 appropriate tool to apply here.

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1 Q Did you do research to assess what kind of
2 protocols or methodologies should be used in conjunction
3 with PageRank to help it properly assess the question of
4 centrality when studying a software platform?

5 MR. RAMSEY: Objection; form.

6 THE WITNESS: I did read prior research, and I
7 believe I have provided citations to those papers that I
8 relied on in my report.

9 MS. ANDERSON: Okay.

10 (Exhibit 1443 was marked for
11 identification by the Court Reporter.)

12 MS. ANDERSON: I'm going to show you what has
13 been marked as 1443 to your deposition. Exhibit 1443 is
14 an article entitled "Helping Program Comprehension of
15 Large Software Systems by Identifying Their Most
16 Important Classes," authored by Ioana Sora.

17 Q Have you seen this document before?

18 A I saw this document for the first time yesterday
19 afternoon.

20 Q In what context did you see this for the first
21 time?

22 A Yesterday afternoon when I reviewed
23 Dr. Astrachan's third report. He cites this paper in
24 his February 29th report.

25 Q Okay. And did you read it in its entirety?

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1 A Yes, I did read this; although, admittedly,
2 quickly, given the time constraints yesterday, but I
3 have read this entire paper from front to back.

4 Q And do you have an understanding that this
5 article, Exhibit 1443, makes recommendations about what
6 needs to be studied when applying an analysis like
7 PageRank to a software system?

8 MR. RAMSEY: Objection; form.

9 THE WITNESS: Well, like all academic articles,
10 it does contain recommendations, but they are
11 recommendations that I disagree with, and I believe that
12 this article is, frankly, not very good.

13 BY MS. ANDERSON:

14 Q Okay. Which, if any, recommendations in
15 Exhibit 1443 do you disagree with?

16 A I disagree with. Well, let me back up.

17 First off, I would characterize this paper as
18 someone doing research using static analysis, a PageRank
19 measure to look at software and, in particular, to
20 identify what the author describes as most important
21 classes, so up until that point, this author is doing
22 exactly what I did, and the fact that Dr. Astrachan has
23 included this in his report, in my mind, supports the
24 notion that, in general, he is in agreement with my use
25 of the PageRank approach in analyzing the centrality in

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1 helping to identify most important classes within a
2 piece of object-oriented software.
3 So that's the part that I can do a full stop
4 where I agree with it, but, however, I do have sources
5 of disagreement.
6 MS. ANDERSON: All right. So move to strike.
7 The answer is nonresponsive.
8 Q My question to you --
9 MR. RAMSEY: Oracle disagrees and -- with that
10 objection and the motion.
11 BY MS. ANDERSON:
12 Q My question to you, sir, is: What portions of
13 Exhibit 1443, if any, do you disagree with?
14 A All right. Let me try again.
15 This author, in the main, does something quite
16 similar to what I do, with one -- one distinction, and
17 the distinction is what I disagree with.
18 Q What is the distinction that you say you disagree
19 with?
20 A All right. What this author does is they engage
21 in the PageRank analysis, which, as part of PageRank
22 analysis, it identifies these connections and then
23 weights them as part of the standard PageRank analysis
24 by your -- your connections to a particular class are --
25 you are counted in terms of how many connections there

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1 are, and then they are weighted by the things that are
2 connected to you, how many things are connected to them,
3 so it's a recursive type of algorithm, so that's
4 standard PageRank analysis.
5 What this author does is then they go one more
6 step and they add a set of subjective weights to the
7 standard PageRank analysis, and that's the part that I
8 disagree with.
9 Q Where in the article does the article describe
10 this aspect that you disagree with?
11 A All right. If you turn to page 3, it is
12 primarily in the paragraph that starts with: The
13 strength of a dependency.
14 Do you see that?
15 Q Okay.
16 A So penultimate paragraph on page 3.
17 Q Is this the paragraph with which you have
18 disagreement?
19 A This is where they identify this notion of
20 weighting -- I mean, they're -- I'm not going to limit
21 my disagreements to this one paragraph, particularly
22 given that I've only read this paper once, yesterday
23 afternoon, but this certainly, I think, is a critical
24 paragraph in this paper, based on my limited reading of
25 it yesterday.

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1 Q Why? Why is that?
2 A Why is that. Because what they do -- or what
3 the -- the single author does is -- having PageRank, and
4 then they basically, arbitrarily, create these weights,
5 which they describe in this paragraph, but these weights
6 have no particular basis, and what I mean by that is --
7 I mean, you know, this sort of software measurement --
8 this is the kind of work that I've been doing for
9 30 years. You know, this kind of paper, in my
10 professional opinion and as someone who writes in this
11 area and has been a referee and editor in this area, is
12 not very good, because these weights are essentially
13 subjective and ad hoc, and the author makes no attempt
14 to do any validation of these measures in a -- in a
15 normal, what I would consider appropriate kind of
16 analysis where these weights would have come from --
17 would have been some notion that they would be tested
18 against some other variable of interest.
19 So a very typical thing in software measurement
20 research; for example, someone wants to propose a new
21 measure and they say, for example, "Here's my measure of
22 complexity," they will then do a test showing some
23 correlation between that measure and some variable of
24 interest, say quality, you know, defects, that kind of
25 thing.

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1 This author does nothing. They -- like that.
2 They just -- these numbers come out of -- you know, sort
3 of thin air. There's no validation of these numbers at
4 all. So that's a significant concern.
5 Frankly, again, I, again, got a copy of this off
6 the web last night. I'm not sure if this paper has even
7 been peer-reviewed.
8 Q When you say the numbers have no validation,
9 which numbers are you referring to?
10 A Where it's described in the paragraph. It says:
11 We assign weight 1, level 2. Weights will sum up
12 level 3, and other weights have weights 4, all the --
13 that's -- that's the entirety of their description. I'm
14 trying to infer what has gone on here, and, again, there
15 is nothing that tells me these have any context or any
16 reliability.
17 Q Beyond that criticism, is there anything else
18 that, as you sit here today, you are aware of with which
19 you disagree in this article, Exhibit 1443?
20 A Well, again, subject to the caveat that I've read
21 this once, yesterday afternoon, and I may -- if I --
22 when I have an opportunity to read it more carefully
23 have other concerns, it basically fails the most
24 elemental test, in my view.
25 If you think about what they say they have

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1 accomplished is that they have done this better job of
 2 PageRank by taking standard PageRank analysis that's
 3 widely used and they have added these weights to it and
 4 that's meant to be better.

5 But when all is said and done, they go off and
 6 they do their analysis using their own idiosyncratic
 7 model. They run it on, let's see, one, two -- half a
 8 dozen pieces of software, and then they report their
 9 results. All right? And their -- what they use as
 10 their basis for deciding if their model is any good or
 11 not is -- you know, does it identify the classes that
 12 they set up as the answer to this, which are classes
 13 they pulled out of the documentation for the software.

14 And what they don't do, which would be the -- the
 15 obvious thing to do and the only thing -- or, excuse me,
 16 not the only thing, but the thing that you would
 17 minimally have to do to support their conclusion that
 18 what they have done is some improvement is do the same
 19 analysis using standard PageRank analysis and then show
 20 that there was some improvement on some element here.

21 For example, they don't actually use the term
 22 "discrimination," but in this kind of research,
 23 typically what one of the ways we evaluate is we say,
 24 "All right. Here's this tool to try to identify
 25 something. Does it -- is it highly discriminatory?

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1 Does it tell you the things -- does it find the things
 2 you are looking for and not give you sort of false
 3 positives kind of thing, or false negatives?"
 4 And what you would expect to see in this -- or
 5 this -- a well-done piece of research, you would expect
 6 to see them saying, "Look, as the base case, I ran
 7 PageRank as everyone understands it." All right? And
 8 I'm not going to call it the non-weighted PageRank
 9 because that's, strictly speaking, not true, because
 10 PageRank does have within it a set of weights, but if I
 11 say -- if I refer to it as the baseline PageRank, you
 12 will understand me to mean the PageRank that everybody
 13 else uses except for this author. And then I would
 14 expect them to say, "And here's our" -- or "this
 15 person's model," and -- and show and demonstrate in some
 16 way that it was an improvement.

17 But they do not conduct such analysis. They
 18 simply make the claim that we have done something
 19 better, when, frankly, the analysis that they would need
 20 to do to support that claim is very simple, very
 21 straightforward. Certainly was available to them
 22 because they have some tool that's computing PageRank
 23 for them, yet they failed to do such analysis, and to
 24 me, that is -- is a glaring flaw and one that means that
 25 you cannot accept their conclusions because they haven't

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1 done the necessary analysis that would support such
 2 conclusions.

3 Q Do you have an understanding -- strike that.
 4 Can you explain to me how a particular instance
 5 variable would be weighted when it's run through
 6 Understand as was used in the analysis reflected in your
 7 opinions?

8 MR. RAMSEY: Objection; form.

9 THE WITNESS: I'm sorry, so we are no longer
 10 talking about the Romanian paper?

11 MS. ANDERSON: You can set aside Exhibit 1443 for
 12 now.

13 THE WITNESS: Sorry, can you repeat the question,
 14 because I was -- I was looking for it in the context of
 15 what we were talking about.

16 MS. ANDERSON: No problem.

17 Q Do you have enough familiarity with Understand to
 18 explain to me how a particular instance variable would
 19 be weighted?

20 A No.

21 Q As part of the analysis that was performed in
 22 connection with your centrality opinions, did your
 23 methodology adjust in any way for classes that are not
 24 used?

25 MR. RAMSEY: Objection; form.

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1 BY MS. ANDERSON:
 2 Q For example, legacy code?
 3 A I don't know.
 4 Q All right. Let's take a look at your rebuttal
 5 opinion, paragraph 51, and that's Exhibit 1440.
 6 A I'm sorry, paragraph 50 or page --
 7 Q Paragraph 51 --
 8 A -- 51 --
 9 Q -- and appears --
 10 A Thank you.
 11 Q -- on page 20 of your rebuttal report under the
 12 heading "Qualitative Centrality of the Java APIs to
 13 Java SE 5."
 14 A If you give me a minute --
 15 Q Sure?
 16 A -- let me read this.
 17 Okay. I'm sorry. I see the paragraph you have
 18 pointed me to.
 19 Q Thank you.
 20 In the second -- actually, strike that.
 21 In the third sentence of paragraph 51 where you
 22 state, quote: As discussed in the rebuttal report of
 23 Dr. Schmidt at Section 8-B, upon which I rely, the Java
 24 APIs are a fundamental portion of the Java SE platform
 25 and provide developers important capabilities, end

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1 A Well, I've done a lot of research on software
 2 maintenance and software volatility, which is sort of,
 3 you know, the inverse of stability, like quality and
 4 defects are inverse.

5 So, yes, I'm familiar with the -- the -- this
 6 work in this area and then literature, and I have done
 7 research in this area.

8 Q How many times, prior to this case, did you
 9 perform stability analyses of the sort that you
 10 performed in this case?

11 A Well, again, if we are talking, you know, broadly
 12 about software volatility, you know, multiple times.

13 There are -- there are papers on my CV.

14 Q Well, I'm asking you about stability analyses of
 15 the kind you performed in this case.

16 How many times, prior to this case, did you
 17 perform stability analyses of the sort you performed in
 18 this case?

19 MR. RAMSEY: Objection; form.

20 THE WITNESS: Well, again, I can't give you an
 21 exact answer, and, again, to me, stability is like --
 22 it's a dimension of maintain -- maintenance of -- which
 23 I've done a lot of empirical research in that, so I
 24 don't know. Again, I can't give you an exact number,
 25 but a lot of work I've done relates to this topic.

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1 BY MS. ANDERSON:

2 Q Okay. Dr. Kemerer, in this case, the stability
 3 analysis you discuss in your reports is an analysis that
 4 was actually personally conducted by the technical
 5 support team, not yourself; right?

6 MR. RAMSEY: Objection; form.

7 THE WITNESS: No. This was work that I directed,
 8 and, you know, I provided the -- the -- I'm searching
 9 for the word -- the leadership on this effort.

10 BY MS. ANDERSON:

11 Q Well, you didn't write the scripts that are
 12 associated with this analyses; correct?

13 A No, because writing the scripts is a programming
 14 task to do data collection.

15 Q And, in fact, you can't write the scripts that
 16 were needed to do this work because you can't program in
 17 the languages that were used to write those scripts;
 18 true?

19 MR. RAMSEY: Objection; form.

20 THE WITNESS: Again, "can't," I think, overstates
 21 the case, but it would take me a long time.

22 BY MS. ANDERSON:

23 Q You do not have the education to program in the
 24 languages used to write the scripts in this case; is
 25 that true?

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1 A No. I don't have training in the particular
 2 language, but I certainly have the education to do the
 3 work.

4 Q Is it correct that you do not have the background
 5 needed to, as you sit here today, program in the
 6 languages in which the scripts were written to perform
 7 the analysis of stability that supports your opinions?

8 MR. RAMSEY: Objection; form.

9 THE WITNESS: No. I certainly have the
 10 educational background to do so. What I would need
 11 would be the specific language training.

12 BY MS. ANDERSON:

13 Q So that's because you don't have training in any
 14 of the languages used to write the scripts; is that
 15 right?

16 MR. RAMSEY: Objection; form.

17 THE WITNESS: I believe I've said that.

18 BY MS. ANDERSON:

19 Q So you agree with me?

20 A I agree that I have not done training in the
 21 languages that these scripts are written in.

22 Q Thank you.

23 And with respect to the analyses of stability
 24 that you have done for this case, how would you
 25 characterize that stability analysis in terms of a

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1 technological approach to analyzing stability?

2 MR. RAMSEY: Objection; form.

3 THE WITNESS: Well, I'm not certain what you mean
 4 by a "technological approach," but the measure that's
 5 used is, essentially, the same as the measure used in
 6 Exhibit 1441, which they refer to as "CEM."

7 BY MS. ANDERSON:

8 Q Okay. When you say it is essentially the same,
 9 what do you mean by that?

10 A Well, the only reason I qualified it is they
 11 provide in the paper their description of their CEM
 12 measure, the amount of change in existing methods, which
 13 is shown in their Formula 8. And it appears to me to be
 14 the same as what we did, but I always qualify it because
 15 there's never enough information in the paper to say
 16 it's exactly what they did, but my understanding, based
 17 on my reading of the paper, is that what we have done is
 18 the same as what they have done.

19 Q When you say "they," are you talking about the
 20 author of Exhibit 1444?

21 A Yes.

22 Q And what are you saying is the same as what you
 23 did in this case?

24 A I believe that the -- the measure of stability,
 25 the amount of change in existing methods, is the same as

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1 Q D, as in dog, to your reply.
 2 A Okay. Do you have a page number?
 3 Q It is page 35.
 4 A I'm sorry --
 5 Q 35 of your reply.
 6 A Oh, I thought you said Appendix --
 7 Q It's Appendix D, but it still says page 35 in
 8 mine.
 9 A Really. Okay.
 10 Q The one that's entitled "R Script for Calculating
 11 Package Change."
 12 A Then I'm a little confused.
 13 Q Let me give you another copy, because I think
 14 that they are broken up. You may be getting confused
 15 there. You know, actually --
 16 A Well, if I hand you my copy, do you want to find
 17 the --
 18 Q That's fine, the reply. You are on rebuttal.
 19 A Oh, I'm sorry.
 20 Q There you go.
 21 A My mistake.
 22 Q That's the answer.
 23 A Sorry.
 24 All right. Now, I'm sorry, page 35, Appendix
 25 dog.

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1 Q 35, Appendix dog.
 2 A All right. Okay. I have that now.
 3 Q All right. So Appendix D is one of the scripts
 4 that was used to calculate package change across Android
 5 versions; right?
 6 A Yes.
 7 Q And drawing your attention to the lines of the
 8 script that start on line 30 and go to line 229?
 9 A All right.
 10 Q Okay. What are the items in this list?
 11 A Again, I don't have training in R, so I'm not
 12 going to be able to answer questions about this script.
 13 Q Do you -- but do you recognize the names in this
 14 list that are appearing at lines 30 to 229? Do they --
 15 A Oh, the -- the names in -- in the double
 16 quotations, yes.
 17 Q And what is this list of items from line 30 to
 18 229?
 19 A These appear to be API names.
 20 Q All right. And there are about 200 listed there;
 21 correct?
 22 A Yes, I'd say so.
 23 Q How were these specific 200 API packages selected
 24 for study as part of your analysis?
 25 A I honestly don't recall.

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1 Q Did you ever know?
 2 A I may have at one point.
 3 Q Who would know?
 4 A I don't know the answer to that question either.
 5 Q Do you know whether anyone checked to see what
 6 was in the source code repository for each API level in
 7 preparing this list?
 8 A No, I don't know that.
 9 Q Do you know whether Android always had no more
 10 than 200 packages?
 11 A No, I don't.
 12 Q Do you know whether there were additional Android
 13 packages that were not counted in the analysis that is
 14 reflected in Appendix D?
 15 A I don't know that, no.
 16 Q For the questions that I just asked you where you
 17 said "I don't know," who would you ask to find that out?
 18 A I would ask someone from the technical support
 19 team to find out who was the author of this particular
 20 script.
 21 Q Drawing your attention to -- back to page 31 and
 22 32 of your opening report where you talk about, in
 23 paragraph 102, that there are 64 packages, let's take a
 24 look at that.
 25 A Yes, I'm on 31 of the first report. Sorry --

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1 Q Great.
 2 A -- what was your question?
 3 Q Sure. Take a look at paragraph 102.
 4 A Mm-hmm.
 5 Q Do you see, in that first sentence, it says:
 6 Libcore, this category represents the critical core of
 7 the Android platform and consists of 64 APIs?
 8 Do you see that?
 9 A I do.
 10 Q Do you know where that information came from?
 11 A No.
 12 Q Is it your opinion that that statement is
 13 accurate?
 14 A Well, I don't know that it's not accurate.
 15 MS. ANDERSON: Okay. All right. I'm going to
 16 show you Exhibit 1445.
 17 (Exhibit 1445 was marked for
 18 identification by the Court Reporter.)
 19 BY MS. ANDERSON:
 20 Q Have you seen a list such as Exhibit 1445 before?
 21 A I honestly don't know.
 22 Q Okay. Do any of the names look familiar to you?
 23 A Yes. I mean, certainly there are more than 37,
 24 but looks as if there are names here that are on the
 25 list of 37.

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I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney or any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: March 4, 2016



RACHEL PERRIER
CSR No. 6948

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CORRECTIONS TO DEPOSITION TRANSCRIPT

PAGE 1 of 2 PAGES

NAME OF DEPONENT: Chris F. Kemerer

DATE OF DEPOSITION: 3/3/16

CASE NAME: *Oracle America, Inc. v. Google, Inc.*

COURT: United States District Court – Northern District California

CASE NUMBER: 10-03561 WHA-

INSTRUCTIONS: Please note changes by listing the page and line number in the places indicated on this sheet and listing the changes in the right-hand column. Attach additional sheets as necessary.

PAGE NO.	LINE NO.	READS	SHOULD READ	REASON
20	22	Anon	Anand	Proper name
22	13	Anon	Anand	Proper name
27	12	interest	interests	typo
28	24	term	termed	Transcription error
29	15	very	a very	typo
31	18	a mild	my own	Transcription error
54	25	one	ones	Transcription error
54	25	other	others	typo
56	15	marshmallow	Marshmallow	Proper name
58	4	collect	to collect	Transcription error
66	13	has	it has	Transcription error
66	14	context	contexts	typo
67	2	context	contexts	typo
72	10	implement	implementing	typo
86	8	records	words	Transcription error
89	25	argument	argument,	Transcription error
91	8	network	networks	Transcription error
91	12	and	in a	Transcription error
91	14	commercially	a commercially	Transcription error
95	9	Raw data	A form	Transcription error
114	16	fail	FAIL	quoted
115	15	empirical	an empirical	Transcription error
123	6-7	within stability	with instability	typo

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PAGE 2 of 2 PAGES

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133	1	and I	as I	typo
134	10	platform probably	platform is probably	Transcription error
135	1	interface	intersection	Transcription error
142	4	a count	account	Transcription error
160	14	fluid	cumulative	Transcription error
160	17	Libore	Libcore	typo
164	12	modern	the modern	Transcription error
165	3	as of	as I've	Transcription error
196	15	term is used is	term used is	Transcription error
212	19	expect have	expect to have	Transcription error
212	24	copy	copied	Transcription error

Signature:  Dated: 4/1/16